SURREBUTTAL TESTIMONY AND EXHIBIT OF

DAVID C. PARCELL

ON BEHALF OF

THE SOUTH CAROLINA OFFICE OF REGULATORY STAFF

DOCKET NO. 2019-290-WS

IN RE: APPLICATION OF BLUE GRANITE WATER COMPANY

FOR ADJUSTMENT OF RATES AND CHARGES

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME, OCCUPATION, AND BUSINESS ADDRESS.

A. My name is David C. Parcell. I am a Principal and Senior Economist of Technical Associates, Inc. My address is 2218 Worchester Road, Midlothian, Virginia 23113.

Q. DID YOU FILE DIRECT TESTIMONY AND EXHIBITS IN THIS PROCEEDING?

A. Yes. I filed Direct Testimony and two (2) exhibits with the Public Service Commission of Southern Carolina ("Commission") on January 23, 2020.

Q. WHAT IS THE PURPOSE OF YOUR SURREBUTTAL TESTIMONY?

A. The purpose of this Surrebuttal Testimony is to respond to the Rebuttal Testimony of Blue Granite Water Company ("BGWC") witness Dylan W. D'Ascendis. Witness D'Ascendis' Rebuttal Testimony is generally focused on the following topics: Discounted Cash Flow ("DCF") issues, Capital Asset Pricing Model ("CAPM") issues, Comparable Earnings ("CE") issues, and a business risk (size) adjustment to the cost of equity ("ROE") rate.

Q. HOW IS YOUR SURREBUTTAL TESTIMONY ORGANIZED?

A. My Surrebuttal Testimony follows the same order of subjects contained in witness D'Ascendis' Rebuttal Testimony. My Surrebuttal Testimony therefore addresses the following general areas:

- Discounted Cash Flow Issues;
- Capital Asset Pricing Model Issues;
- Comparable Earnings (CE) Issues;
- Witness D'Ascendis' "Corrected Conclusion of Mr. Parcell's cost of common equity";
- Business risks adjustment proposed by witness D'Ascendis; and
- Other Issues.

Q. DO YOU HAVE ANY GENERAL COMMENTS ABOUT WITNESS D'ASCENDIS' REBUTTAL TESTIMONY AND RECOMMENDATION IN THIS PROCEEDING?

A. Yes, I do. Witness D'Ascendis in his Rebuttal recommends a ROE for BGWC of 9.75 percent to 10.25 percent. This is a reduction from the 10.2 percent to 10.7 percent range recommended in his Direct Testimony. This reduction reflects the obvious decline in capital costs over the past several months.

II. DISCOUNTED CASH FLOW (DCF) ISSUES

Q. WHAT IS THE PRIMARY DCF-RELATED ISSUE IN WITNESS D'ASCENDIS' REBUTTAL TESTIMONY?

A. Witness D'Ascendis' updated DCF results, as contained in his Rebuttal Testimony, is 8.91 percent.[1] This is consistent with my 8.9 percent DCF conclusion, which is noted by witness D'Ascendis (page 6, lines 2-3). Witness D'Ascendis maintains, however, that it is improper to assign "undue weighting" to DCF results at this time.

[1] Rebuttal Testimony of Dylan W. D'Ascendis at Exhibit DWD-1R, page 2.

Q. WITNESS D'ASCENDIS MAINTAINS ON PAGES 6-7 OF HIS REBUTTAL TESTIMONY THAT THE DCF MODEL HAS A TENDENCY TO UNDERESTIMATE THE INVESTOR-REQUIRED RETURN RATES, AND, THUS, THE COST OF EQUITY FOR A UTILITY WHEN THE MARKET PRICE OF UTILITY STOCKS EXCEEDS THE BOOK VALUE. DO YOU AGREE WITH THIS POSITION?

A. No, I do not. Knowledgeable, informed investors are well aware of the fact that most utilities have their rates set based on the book value of their assets (*i.e.*, rate base and capital structure). This knowledge is reflected in the prices that investors are willing to pay for stocks and thus is reflected in DCF cost rates. To make a modification of the DCF cost rates, as witness D'Ascendis implicitly proposes, amounts to an attempt to "reprice" stock values in order to develop a DCF cost rate more in line with what he thinks the results should be. This is clearly a violation of the principle of "efficient markets," which is the basis for all market-based ROE models. If one believes that markets are efficient, there is no reason to modify either stock prices or market models that are based on stock prices.

Q. DOES YOUR DCF RECOMMENDATION GIVE ANY CONSIDERATION TO THE RELATIVELY LOWER DCF RESULTS AT THE CURRENT TIME?

A. Yes. My 8.9 percent DCF recommendation reflects the top-end of all of my DCF results. In turn, this reflects the highest of all the DCF results.

III. CAPITAL ASSET PRICING MODEL (CAPM) ISSUES

Q. WITNESS D'ASCENDIS STATES ON PAGES 13-14 OF HIS REBUTTAL TESTIMONY THAT YOUR USE OF 20-YEAR U.S. TREASURY BONDS IGNORES THE FACT THAT BOTH THE COST OF CAPITAL AND

RATEMAKING ARE PROSPECTIVE. DO YOU HAVE ANY COMMENTS ON HIS POSITION?

A. Yes, I do. Given that witness D'Ascendis' risk premium model relies on historic risk premiums dating back to 1926, I find his statement to be inconsistent with his own analyses. Nevertheless, my use of 20-year U.S. Treasury bonds uses the most recent three-month average yields.

Q. WHY DO YOU USE 20-YEAR U.S. TREASURY BOND YIELDS?

A. As I indicated in my Direct Testimony, I use the yields on 20-year U.S. Treasury bonds since this is the maturity level employed in the Duff & Phelps studies that were partially used in my development of the risk premium component of the CAPM. Thus, my risk-free rate and risk premium components are consistent and use the same time frame.

Q. ON PAGES 13-14 OF HIS REBUTTAL TESTIMONY, WITNESS D'ASCENDIS MAINTAINS THAT YOUR CAPM ANALYSIS SHOULD HAVE USED FORECASTED YIELDS ON U.S. TREASURY BONDS RATHER THAN THE CURRENT YIELDS YOU USED. WHAT IS YOUR RESPONSE TO HIS ASSERTION?

A. I disagree with witness D'Ascendis. It is proper to use the current yield as the risk-free rate in a CAPM context, because the current yield is known and measurable and reflects investors' collective assessment of all capital market conditions. Prospective interest rates, in contrast, are not measurable and not achievable. For example, if the current yield on 20-year U.S. Treasury Bonds is 2.0 percent, this reflects the rate that investors can actually receive on their investment. Investors cannot receive a prospective yield on their investments since such a yield is not actual but rather speculative.

Use of the current yield in a DCF context is similar to using the current risk-free rate in a CAPM context. Analysts do not use prospective stock prices as the basis for the dividend yield in a DCF analysis, as use of prospective stock prices is speculative. Use of current stock prices is appropriate, as this is consistent with the efficient market hypothesis. Likewise, current levels of interest rates reflect all current information (*i.e.*, the efficient market hypothesis) and should be used as the risk-free rate in the CAPM.

Q. DO YOU HAVE ANY ADDITIONAL COMMENTS REGARDING WITNESS D'ASCENDIS' CLAIMS THAT PROJECTED INTEREST RATES SHOULD BE USED AS THE RISK-FREE RATE IN A CAPM CONTEXT?

A. Yes, I do. Witness D'Ascendis claims on page 15 of his Rebuttal Testimony that it is proper to use interest rate forecasts from Blue Chip Financial Forecasts. However, it is apparent that the use of projected rates frequently leads to an overstatement of 30-Year U.S. Treasury bond yields, thus rendering these assumptions in witness D'Ascendis' ROE models incorrect. The table below shows the historic projection of 30-Year U.S. Treasury bonds by Blue Chip, as well as the actual yields.

Date of Blue Chip	Forecast Period	Forecast 30-Year T Bonds	Actual 30-Year T Bonds Yield	Over (under) Forecast to Actual Yield
Nov. 1, 2009	1 Q 2011	5.00%	4.56%	0.44%
Nov. 1, 2010	1 Q 2012	4.50%	3.14%	1.36%
Nov. 1, 2011	1 Q 2013	3.80%	3.28%	0.52%
Nov. 1, 2012	1 Q 2014	3.40%	3.68%	(0.28%)
Nov. 1, 2013	1 Q 2015	4.20%	2.55%	1.65%
Nov. 1, 2014	1 Q 2016	4.10%	2.72%	1.38%
Nov. 1, 2015	1 Q 2017	3.80%	3.04%	0.76%
Nov. 1, 2016	1 Q 2018	3.10%	3.03%	0.07%
Nov. 1, 2017	1 Q 2019	3.60%	3.01%	0.59%

This indicates that in eight of the last nine years, forecasts of 30-Year U.S. Treasury bonds exceeded actual levels. In some years, the differential was substantial (*e.g.*, 2010, 2013, 2014, 2015 and 2017). As a result, any witness or commission who relied upon forecasted interest rates would have over-estimated the ROE.

Q. WITNESS D'ASCENDIS STATES ON PAGES 17-20 OF HIS REBUTTAL TESTIMONY THAT IT IS IMPROPER TO CONSIDER GEOMETRIC MEAN RETURNS IN THE DETERMINATION OF A RISK PREMIUM AND THAT ONLY ARITHMETIC RETURNS ARE APPROPRIATE. DO YOU AGREE WITH THIS POSITION?

A. No, I do not. It is apparent that investors should have access to both types of returns when making investment decisions.

In fact, it is noteworthy that mutual fund investors regularly receive reports on their own funds, as well as prospective funds they are considering investing in, which show only geometric returns. Based on this consideration, I find it difficult to accept witness D'Ascendis' position that only arithmetic returns are appropriate.

Q. DOES WITNESS D'ASCENDIS USE VALUE LINE INFORMATION IN HIS COST OF CAPITAL ANALYSES?

A. Yes, he does. He has in fact cited Value Line reports on various electric utilities on his Exhibit No. 1, Schedule DWD-1R, pages 3-10.

Q. DO THE VALUE LINE REPORTS SHOW HISTORIC AND PROSPECTIVE GROWTH RATES FOR THE WATER UTILITIES?

A. Yes, they do.

Q. DO THESE VALUE LINE REPORTS SHOW HISTORIC AND PROSPECTIVE RETURNS ON AN ARITHMETIC BASIS?

A. No, they do not.

Q. DO THE VALUE LINE REPORTS SHOW HISTORIC AND PROSPECTIVE RETURNS ON A GEOMETRIC, OR COMPOUND GROWTH RATE, BASIS?

A. Yes, they do. Schedule 1 of Surrebuttal Exhibit DCP-1 describes Value Line's method of calculating growth rates. As a result, any investor reviewing Value Line, as witness D'Ascendis does, would be using geometric growth rates.

Q. ARE GEOMETRIC MEANS USED ELSEWHERE IN THE FINANCIAL WORLD TO MEASURE GROWTH IN RETURNS?

A. Yes, they are. Mutual funds, in compliance with U.S. Securities and Exchange Commission ("SEC") regulations, report fund returns that are expressed on a geometric (compound) basis. Schedule 2 of Surrebuttal Exhibit DCP-1 is a report by T. Rowe Price Funds that demonstrates this. Any potential or actual investor who was reviewing this report would be viewing returns on a compound basis.

Q. IS IT YOUR POSITION THAT ONLY GEOMETRIC GROWTH RATES SHOULD BE USED?

A. No. I believe that both arithmetic and geometric growth rates should be used as I have done in my Direct Testimony.[2] This is the case because investors have access to both and presumably use both. This is also consistent with the efficient market hypothesis.

Q. ON PAGES 20-21 OF HIS REBUTTAL TESTIMONY, WITNESS D'ASCENDIS CRITICIZES YOU FOR USING "TOTAL RETURNS" ON U.S. LONG-TERM

[2] Direct Testimony of David C. Parcell at p. 29 and Exhibit DCP-2, Schedule 8.

BONDS IN DEVELOPING YOUR CAPM RISK PREMIUM, RATHER THAN ONLY "INCOME RETURNS" AS HE PROPOSES. WHAT IS YOUR RESPONSE TO THIS?

A. I disagree. In my CAPM risk premium, I am comparing total returns for stocks (as does witness D'Ascendis) with total returns for bonds (he only considers income returns). The stock return includes both income (dividends) and capital gains. Any true and relevant comparison for bonds should also include income (interest) and capital gains for bonds. I have consistently done this, and witness D'Ascendis has not.

Q. ON PAGES 16-17 OF HIS REBUTTAL TESTIMONY, WITNESS D'ASCENDIS ALSO TAKES ISSUE WITH YOUR USE OF ACHIEVED RATES OF RETURN ON BOOK EQUITY IN DERIVING THE EQUITY RISK PREMIUM IN YOUR CAPM ANALYSIS. WHAT IS YOUR RESPONSE TO THIS?

A. I disagree with witness D'Ascendis. As I indicate on page 29 of my Direct Testimony, I used measures of both book returns and market returns in developing my CAPM market risk premium components. The rates (*i.e.*, prices) of public utilities are set based upon the book values of their rate base and capital structures, as well as the book levels of expenses and revenues. As such, it is appropriate to consider the level of return on book equity in the determination of the cost of equity (which is applied to the book level of common equity). I also note that the risk premium I derive from my use of book rates of return is the highest of the three risk premiums I considered in my CAPM analyses.

Q. ON PAGES 21-22 OF HIS REBUTTAL TESTIMONY, WITNESS D'ASCENDIS MAINTAINS YOU SHOULD HAVE INCORPORATED AN EMPIRICAL CAPM IN YOUR ANALYSES. DO YOU AGREE?

A. No, I do not agree. Witness D'Ascendis advocates what he describes as an "empirical" CAPM analysis. This form of the CAPM assumes that beta for an industry understates the industry's volatility and, thus, its risk and that it is necessary to substitute the overall market's beta (*i.e.*, 1.0) for one-fourth of the industry's actual beta. Witness D'Ascendis assumes that the appropriate beta in a CAPM analysis is a combination of the actual industry beta with a 75 percent weight and a hypothetical beta of 1.0 with a 25 percent weight.

The use of an empirical CAPM overstates the cost of equity for companies with betas below that of the market. What the empirical CAPM actually does is inflate the CAPM cost for the selected company or industry on one-fourth of its equity and assumes that one-fourth of the company has the risk of the overall market. This is not appropriate for BGWC or for other utilities.

Q. DO YOU AGREE WITH WITNESS D'ASCENDIS' "RECALCULATION" OF YOUR CAPM ANALYSES, ON PAGE 24 AND IN SCHEDULE DWD-5R OF HIS REBUTTAL TESTIMONY?

A. No, I do not. For the same reasons I have previously indicated in this Surrebuttal Testimony, his proposed manipulations of my CAPM analyses are not appropriate.

IV. COMPARABLE EARNINGS (CE) ISSUES

Q. ON PAGE 25 OF HIS REBUTTAL TESTIMONY, WITNESS D'ASCENDIS INDICATES HIS BELIEF THAT YOUR ASSOCIATION OF MARKET-TO-BOOK RATIOS AND RETURNS ON EQUITY ARE "NOT SUPPORTED BY EITHER THE ACADEMIC LITERATURE NOR BY A HISTORICAL ANALYSIS

OF THE EXPERIENCE OF UNREGULATED COMPANIES." WHAT IS YOUR RESPONSE TO THIS?

A. I disagree with witness D'Ascendis on this point. Clearly, public utilities have their rates regulated (*i.e.*, set) based upon their book value of rate base and capital structure. Investors are aware of this relationship (*i.e.*, efficient market hypothesis). Any reference to the experience of unregulated companies, as is evident in witness D'Ascendis' Rebuttal Testimony, simply misses the point of public utility regulation.

Q. ON PAGES 25-26 OF HIS REBUTTAL TESTIMONY, WITNESS D'ASCENDIS STATES THAT HE HAS "PERFORMED AN ANALYSIS TO DETERMINE THE EXISTENCE OF A DIRECT RELATIONSHIP BETWEEN THE MARKET-TO-BOOK RATIOS OF UNREGULATED COMPANIES AND THEIR EARNED RATES OF RETURN ON BOOK COMMON EQUITY." IS HIS STUDY RELEVANT FOR PUBLIC UTILITIES?

A. No, it is not. Witness D'Ascendis' study applies to the S&P 500, which is predominately made up of unregulated firms. Many unregulated firms, such as energy producing companies and technology-related companies, have book values that do not reflect the actual value of their underlying assets. As a result, the prices they charge are not related to the book value of their assets.

Utilities, in contrast, have their rates established based upon the book values of their assets (*i.e.*, rate base) and liabilities/common equity (*i.e.*, capital structure). As a result, book value is very relevant for utilities.

Q. ARE THERE ANY INCONSISTENCIES BETWEEN WITNESS D'ASCENDIS' CRITICISM OF YOUR REFERENCE TO MARKET-TO-BOOK ("M/B") AND OTHER PARTS OF HIS TESTIMONY?

A. Yes. Recall that witness D'Ascendis claims, in his DCF analyses and Rebuttal Testimony, that earnings per share ("EPS") is the primary consideration in expected growth rates. This is equivalent to saying that EPS is the primary determinant of stock prices. Yet, he is claiming that ROE and M/B are not related. These are inconsistent positions.

ROE is EPS divided by book value per shares ("BVPS"). M/B is stock price divided by BVPS. Thus, BVPS is a component in both ratios. Logically, and mathematically, if EPS and stock price are related, then ROE and M/B are related. Thus, if EPS drive stock prices, as witness D'Ascendis claims in his DCF analyses, then ROE drives M/B.

Q. WITNESS D'ASCENDIS STATES ON PAGE 27 OF HIS REBUTTAL TESTIMONY THAT ANY PROXY GROUP SELECTED FOR A CE ANALYSIS SHOULD BE "BROAD BASED" AND NOT INCLUDE OTHER UTILITIES. DO YOU AGREE?

A. No, I do not. Witness D'Ascendis maintains that a proxy group selected for use in a CE analysis "should exclude utilities to avoid circularity since the achieved returns on book common equity of utilities, being a function of the regulatory process, are substantially influenced by regulatory awards." In reality, this is the reason that utility returns should be considered in a CE analysis.

I do not regard the use of utility returns as being circular. In contrast, use of utility returns is necessary and appropriate in order to conform to the "relative risk" dictates of

the *Bluefield*[3] and *Hope*[4] decisions cited in my Direct Testimony. Contrary to witness D'Ascendis' position, it is appropriate to consider the impact of ROE awards since these reflect the same types of analyses (*i.e.*, DCF, CAPM, and CE) that should be utilized in the current proceeding.

V. WITNESS D'ASCENDIS' "CORRECTED CONCLUSION OF MR. PARCELL'S COST OF COMMON EQUITY"

Q. ON PAGE 31 OF HIS REBUTTAL TESTIMONY, WITNESS D'ASCENDIS PRESENTS WHAT HE DESCRIBES AS "CORRECTIONS" TO YOUR DCF, CAPM, AND CE RESULTS. DO YOU AGREE WITH THESE "CORRECTIONS?"

A. No, I do not. In fact, his analyses are not "corrections" at all, but rather reflect his criticisms of my Direct Testimony and the substitution of his model inputs for my inputs. As I have described above, his criticisms and "corrections" are without merit and do not reflect proper implementations of the DCF, CAPM, and CE analyses and should be rejected by the Commission.

Q. BASED UPON YOUR REVIEW OF WITNESS D'ASCENDIS' REBUTTAL TESTIMONY, DO YOU STILL RECOMMEND A ROE FOR BGWC OF 9.45 PERCENT?

A. Yes, I do. There is nothing in witness D'Ascendis' Rebuttal Testimony that causes me to change my analyses, data sources, or recommendations.

[3] *Bluefield Water Works and Improvement Co. v. Public Serv. Comm'n of West Virginia*, 232 U.S. 679 (1923).

[4] *Federal Power Comm'n v. Hope Natural Gas Co.*, 320 U.S. 591 (1942).

VI. BUSINESS RISKS ADJUSTMENT PROPOSED BY WITNESS D'ASCENDIS

Q. WITNESS D'ASCENDIS MAINTAINS ON PAGES 31-33 OF HIS REBUTTAL TESTIMONY THAT BGWC IS A SMALL COMPANY AND ITS OWN SIZE IMPLIES IT SHOULD BE REWARDED WITH A HIGHER RATE OF RETURN. DO YOU HAVE ANY RESPONSE TO THIS?

A. Yes, I do. As I have noted on pages 16-17 of my Direct Testimony, BGWC is not publicly-traded and does not access equity markets for new common equity. As a result, the perceived small size of BGWC should not be considered as a factor in establishing its cost of equity.

Q. IS IT PROPER TO COMPARE THE SIZE OF BGWC TO THE WATER PROXY COMPANIES AND MAKE RISK COMPARISONS BASED UPON THE SIZE DIFFERENTIALS BETWEEN THEM?

A. No, it is not proper. Most of the proxy water utilities have multiple subsidiaries that operate in different jurisdictions. Following witness D'Ascendis reasoning, each of the subsidiaries of the proxy water utilities should be considered as riskier than the proxy group since, by definition, they would have to be smaller. This reasoning is flawed, since these individual water company subsidiaries do not raise equity capital directly from investors, but rather do so as a consolidated entity.

Q. HAVE YOU GIVEN ANY CONSIDERATION TO BGWC'S SPECIFIC CIRCUMSTANCES IN DEVELOPING YOUR 9.45 PERCENT ROE RECOMMENDATION?

A. Yes, I have. My 9.45 percent ROE recommendation reflects the top-end of both my DCF and CE analyses in order to give some consideration to any perceived unique

attributes of BGWC. Had I used the mid-points of the DCF and CE analyses, my ROE conclusions would have been lower.

VII. OTHER ISSUES

Q. WITNESS D'ASCENDIS MAINTIANS ON PAGE 41 OF HIS REBUTTAL TESTIMONY THAT THE COMMISSION ACCEPTED HIS ROE RECOMMENDATION IN DOCKET NO. 2017-292-WS. DO YOU HAVE ANY RESPONSE TO THIS ASSERTION?

A. Yes, I do. This Commission adopted a ROE for BGWC (then known as Carolina Water Service) of 10.5 percent, which was near the lower end of witness D'Ascendis' 10.45 percent to 10.95 percent recommendation.[5] Given that witness D'Ascendis' updated ROE recommendation in the current case is 9.75 percent to 10.25 percent, a similar conclusion in the current proceeding would imply a 9.8 percent ROE.

However, I also note that several of the assumptions in witness D'Ascendis' ROE analyses in the prior proceeding have been demonstrated to over-state capital costs. For example, witness D'Ascendis' risk premium analyses used a 4.86 percent "adjusted prospective yield on A rated public utility bonds."[6] Actual yields on A-rated public utility bonds since BGWC's last rate case have been well below 4.86 percent, as shown on my Direct Testimony Exhibit DCP-2, Schedule 2, and are currently 3.6 percent (or over 100 basis points less than 4.86 percent). As a result, witness D'Ascendis' ROE models and projections in the prior proceeding resulted in an excessive ROE recommendation.

[5] Docket No. 2017-292-WS.

[6] Direct Testimony of Dylan W. D'Ascendis at Exhibit DWD-4, p. 3, in Docket No. 2017-292-WS.

Another example of witness D'Ascendis' overstated ROE model assumptions was his use of a 3.58 percent "forecast of 30-year Treasury Bonds" in his CAPM analyses in the prior proceeding.[7] The actual yields on 30-Year Treasury bonds have been well below 3.58 percent and are currently 2.25 percent, or some 125 basis points less than the projections used by witness D'Ascendis. As a result, the assumptions used in witness D'Ascendis' CAPM analyses resulted in an excessive ROE recommendation.

In summary, the assumptions inherent in witness D'Ascendis ROE analyses in Docket No. 2017-292-WS are demonstrated to have significantly over-stated the level of interest rates and, thus, over-states the required ROE for BGWC. As a result, the claim that the Commission adopted his recommendation in that proceeding should not be used as any demonstration that this should carry over into the current proceeding.

Q. WILL YOU UPDATE YOUR TESTIMONY BASED ON INFORMATION THAT BECOMES AVAILABLE?

A. Yes. ORS reserves the right to revise its recommendations via supplemental testimony should new information not previously provided by the Company or other sources become available.

Q. DOES THIS CONCLUDE YOUR SURREBUTTAL TESTIMONY?

A. Yes, it does.

[7] Direct Testimony of Dylan W. D'Ascendis at Exhibit DWD-5, p. 2, in Docket No. 2017-292-WS.

HOW TO INVEST IN COMMON STOCKS

A Guide to Using
THE VALUE LINE
INVESTMENT SURVEY

GLOSSARY

Aaa Corporate Bond Rate—the average yield on corporate bonds rated Aaa by Moody's Investors Service. Bonds that are rated Aaa are judged to be of the best quality.

Accrual Accounting—a method of matching income and expenses in the period they are actually applicable, regardless of the date of collection or payment.

Adjustable-Rate Mortgage Loans (ARMs) (Bank and Thrift Industries)—mortgage loans on which the interest rate charged by the lender is adjusted in accordance with a stipulated, publicly available cost-of-funds index, such as the yield on one-year Treasury bills. (*See Fixed-Rate Mortgage Loans.*)

After market—the market for replacement parts and accessories for a product or group of products. The Auto Parts (Replacement) Industry participates in the automotive after market.

After-Tax Corporate Profits—*see Corporate Profits.*

AFUDC—*see Allowance for Funds Used During Construction.*

Allowance for Funds Used During Construction (Electric Utility Industries)—a non cash credit to income consisting of equity and debt components. This non cash income results from construction work in progress and is expected to be converted into cash income at a future date.

American Depository Receipts (ADRs)—since most other nations do not allow stock certificates to leave the country, a foreign company will arrange for a trustee (typically a large bank) to issue ADRs (sometimes called American Depositary Shares, or ADSs) representing the actual, or underlying, shares. Each ADR is equivalent to a specified number of shares (the ratio is shown in a footnote on the Value Line page).

American Stock Exchange Composite—a market-capitalization weighted index of the prices of the stocks traded on the American Stock Exchange.

Annual Change D-J Industrials (Investment Companies)—the annual change from year end to year end in the Dow Jones Industrial Average, expressed as a percentage.

Annual Change in Net Asset Value (Investment Companies)—the change in percentage terms of the net asset value per share at the end of any given year from what it was at the end of the preceding year, adjusted for any capital gains distributions made during the year.

Annual Rates of Change (Per Share)—compounded annual rates of change of per-share sales, cash flow, earnings, dividends, and book value (or other industry-specific per-share figures) over the past ten years and five years and estimated over the coming three to five years. All forecasted rates of change are computed from the average figure for the past three-year period to an average for a future three-year period. If data for a three-year base period are not available, a two- or one-year base may be used.

Annual Total Return—the capital gain or loss plus the sum of dividend disbursements expected over the next three to five years, all divided by the recent price and expressed as an average annual rate.

Arbitrage—the simultaneous purchase of an asset in one market and sale of the same asset, or assets equivalent to the asset purchased, in another market. Often referred to as "classical arbitrage," this type of transaction should result in a risk-free profit. Risk Arbitrage refers to transactions in stocks involved in takeover activity.

Arbitrageur—a person or organization that engages in arbitrage activity.

Arithmetic Average—a simple mean. Items to be averaged are added and their sum is divided by the number of items. The result is an arithmetic, or simple, average (or mean).

ARM—*see Adjustable-Rate Mortgage Loans.*

The analyst adjusted rate of savings deposits growth over trailing 10 years as of latest fiscal year

Analyst Adjusted Savings Deposits Growth over Trailing 5 Year Period
The analyst adjusted rate of savings deposits growth over trailing 5 years as of latest fiscal year

Analyst Adjusted Total Assets Growth over Trailing 10 Year Period
Rate of total assets growth over trailing 10 years as of latest fiscal year

Analyst Adjusted Total Assets Growth over Trailing 5 Year Period
Rate of total assets growth over trailing 5 years as of latest fiscal year

Analyst Adjusted Total Revenue Growth over Trailing 10 Year Period
Analyst Adjusted Total Revenue Growth over Trailing 10 Year Period

Analyst Adjusted Total Revenue Growth over Trailing 5 Year Period
Analyst Adjusted Total Revenue Growth over Trailing 5 Year Period

Analyst's Commentary
An approximate 350-word report on each company in Ratings & Reports that discusses recent developments, and evaluates a company's prospects and its corresponding stock.

Analyst's Commentary
An approximate 350-word report on each company page in Ratings & Reports on recent developments and prospects issued every three months on a preset schedule.

Annual Change D-J Ind
Annual change for the Dow Jones Industrial Average for a given year

Annual Change D-J Industrials (Investment Companies)
The annual change from year end to year end in the Dow Jones Industrial Average, expressed as a percentage.

Annual Change in NAV
Annual percentage change in a fund's net asset value for a given year

Annual Change in Net Asset Value (Investment Companies)
The change in percentage terms of the net asset value per share at the end of any given year from what it was at the end of the preceding year, adjusted for any capital gains distributions made during the year.

Annual Rates of Change (Per Share)
Compound yearly rates of change of per-share sales, cash flow, earnings, dividends, and book value, or other industry-specific, per-share figures, over the past 10 years and five years and estimated for the coming three to five years. Historical rates of change are computed from the average figures for a past three-year period to the most recent actual three-year period. Forecasted rates of change are computed from the average figure for the most recent three-year period to an average for a future three-year period. If data for a three-year period are not available, a two- or one-year base may be used.

Annual Total Return
A compound yearly return to shareholders that includes both stock price appreciation and dividend returns.

Annual Total Return Projection
The expected percentage gain (capital appreciation plus dividends) that an investor would achieve per year by purchasing and holding a particular stock.

Annuity
A form of contract sold by life insurance companies that guarantees a fixed or variable payment at some future time.

App
A computer program or piece of software that is designed to fulfill a particular purpose. App is short for Application.

Appreciation Potential
The percentage difference between the recent stock price and the mid point of the 3- 5-year Target Price Range.

Arithmetic Average
Items to be averaged are added and their sum is divided by the number of items. The result is an arithmetic, or simple, average (or mean).

Ask Price
This is the price at which the market is willing to sell the option. The ask price (also known as the "offer" price) is always higher than the bid price, which is the price at which the market maker will buy the option.

Asset Quality (Bank and Thrift Industries)
An indicator of problem loans and other assets relative to total assets. A bank with good asset quality, for example, has a lower percentage of problem loans than the average bank.

Asset Value per share
The total common equity, with securities valued at market, rather than cost, divided by the number of shares outstanding.

Asset Value Per Share Year End (Investment Companies)
The total common equity at year end, with securities valued at market, rather than cost, divided by the number of shares outstanding at year end.

Assets

ANNUAL REPORT

December 31, 2016

T. ROWE PRICE

Equity Market Index Funds

The funds invest to match the performance of their respective indexes.

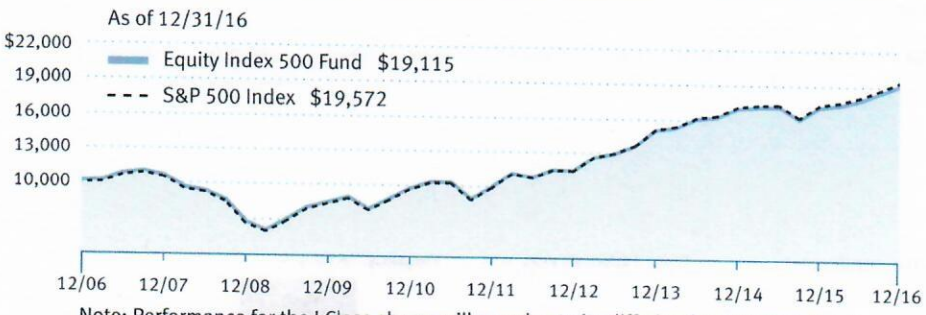
T. Rowe Price Equity Market Index Funds

Performance and Expenses

Growth of $10,000

This chart shows the value of a hypothetical $10,000 investment in the fund over the past 10 fiscal year periods or since inception (for funds lacking 10-year records). The result is compared with benchmarks, which may include a broad-based market index and a peer group average or index. Market indexes do not include expenses, which are deducted from fund returns as well as mutual fund averages and indexes.

EQUITY INDEX 500 FUND



Note: Performance for the I Class shares will vary due to its differing fee structure. See the returns table below.

Average Annual Compound Total Return

Periods Ended 12/31/16	1 Year	5 Years	10 Years	Since Inception	Inception Date
Equity Index 500 Fund	11.70%	14.36%	6.69%	–	–
Equity Index 500 Fund–I Class	11.87	–	–	11.52%	8/28/15

Current performance may be higher or lower than the quoted past performance, which cannot guarantee future results. Share price, principal value, and return will vary, and you may have a gain or loss when you sell your shares. For the most recent month-end performance, please visit our website (troweprice.com) or contact a T. Rowe Price representative at 1-800-225-5132, or for I Class shares, 1-800-638-8790. The performance information shown does not reflect the deduction of a 0.5% redemption fee on shares held for 90 days or less; if it did, the performance would be lower.

This table shows how the fund would have performed each year if its actual (or cumulative) returns for the periods shown had been earned at a constant rate. Average annual total return figures include changes in principal value, reinvested dividends, and capital gain distributions. Returns do not reflect taxes that the shareholder may pay on fund distributions or the redemption of fund shares. When assessing performance, investors should consider both short- and long-term returns.